

# DATA SHEET

CURRENT SENSOR-LOW TCR

## RL Series

size 0603

1%, 2%, 5%

470mΩ

RoHS Compliant & Halogen Free



**YAGEO**

**Phicom**



Product specification

## SCOPE

This specification describes RL0603 current sensor – low TCR chip resistors with lead-free terminations made by thick film process.

## APPLICATIONS

- Power supplies
- Consumer(Mobile、PNDs、...)
- Laptop
- HDDs

## FEATURES

- Products with lead free terminations meet RoHS requirements.
- Reduce environmentally hazardous wastes
- High component and equipment reliability
- None forbidden-materials used in products/production
- Low resistances applied to current sensing

## ORDERING INFORMATION

### - GLOBAL PART NUMBER

Part number is identified by the series name, size, tolerance, packaging type, temperature coefficient of resistance, taping reel, resistance value.

RL 0603	<u>X</u>	<u>X</u>	<u>X</u>	<u>XX</u>	<u>XXXXX</u>	<u>Z</u>
	(1)	(2)	(3)	(4)	(5)	(6)

### (1) TOLERANCE

J = ±5%

G = ±2%

F = ±1%

### (2) PACKAGING TYPE

R = Paper taping reel

### (3) TEMPERATURE COEFFICIENT OF RESISTANCE

"-" = Based on spec.

### (4) TAPING REEL

07 = 7 inch dia. Reel and standard power (1/10W)

### (5) RESISTANCE VALUE

0R47 (470mΩ)

### (6) DEFAULT CODE

Letter Z is system default code for order only <sup>(NOTE)</sup>

## ORDERING EXAMPLE

The ordering code for a RL0603 0.1W chip resistor, value 0.47 Ω with ±1% tolerance, supplied in 7-inch tape reel with 5Kpcs quantify is: RL0603FR-070R47Z.

**MARKING**

RL0603



Fig.2

R= 470 mΩ: 4 digits

The “R” is used as a decimal point; the other 3 digits are significant.

**CONSTRUCTION**

The resistors are constructed out of a high-grade ceramic body. Internal metal electrodes are added at each end and connected by a resistive paste. The composition of the paste is adjusted to give the approximately required resistance and laser cutting of this resistive layer that achieves tolerance trims the value. The resistive layer is covered with a protective coat and printed with the resistance value. Finally, the three external terminations (Cu/Ni/matte tin) are added, as shown in Fig.2.

**OUTLINES**

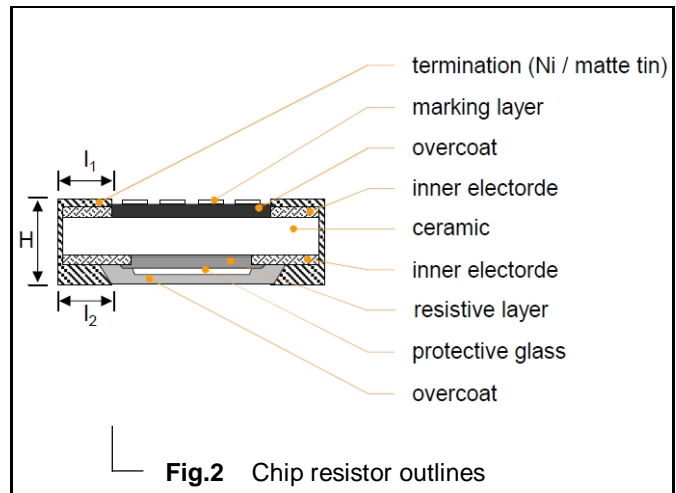


Fig.2 Chip resistor outlines

**DIMENSIONS**

Table 1

TYPE	RL0603
L (mm)	1.60±0.10
W (mm)	0.80±0.10
H (mm)	0.45±0.10
l <sub>1</sub> (mm)	0.25±0.15
l <sub>2</sub> (mm)	0.35±0.15

For dimension, please refer to Table 1

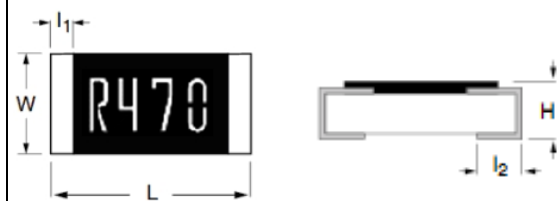


Fig. 3 Chip resistor dimensions

**ELECTRICAL CHARACTERISTICS**

Table 2

**CHARACTERISTICS**

Type	Operating Temperature	Maximum Working Voltage	Tolerance	Temperature Coefficient of Resistance
RL0603	-55°C to +155°C	$\sqrt{(P * R)}$	±1%, ±2%, ±5%	±600ppm/°C

**FUNCTIONAL DESCRIPTION**

**POWER RATING**

Rated Power at 70°C

RL0603 : 1/10W

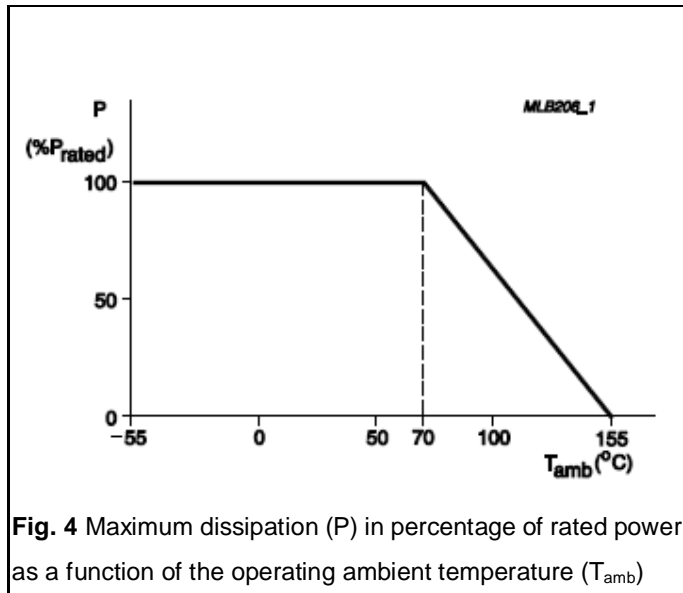
**RATED VOLTAGE**

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$$V = \sqrt{(P * R)}$$

Where

- V=Continuous rated DC or AC (rms) working voltage (v)
- P=Rated power
- R=Resistance value (Ω)



**Fig. 4** Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T<sub>amb</sub>)

**PACKING STYLE AND PACKAGING QUANTITY**

Table 3

PRODUCT TYPE	PACKING STYLE	REEL DIMENSION	QUANTITY PER REEL
RL0603	Paper taping reel	7" (178 mm)	5,000 Units

For paper tape and reel specification/dimensions, please refer to data sheet "Chip resistors packing".

**FOOTPRINT AND SOLDERING PROFILES**

Recommended footprint and soldering profiles, please refer to data sheet "Chip resistors mounting".



**TESTS AND REQUIREMENTS**

TEST	TEST METHOD	PROCEDURE	REQUIREMENT
Life/ Endurance	IEC 60115-1 4.25.1	1,000 hours at 70±2 °C applied RCWV 1.5 hours on, 0.5 hour off, still air required	±(2.0 % + 0.0005 Ω)
High Temperature Exposure/ Endurance at upper category temperature	IEC 60068-2-2	1,000 hours at 125±5 °C,unpowered	±(2.0 % + 0.0005 Ω)
Moisture Resistance	MIL-STD-202 Method 106	Each temperature / humidity cycle is defined at 8 hours (Method 106G), 3 cycles / 24 hours for 10d. with 25 °C / 65 °C 95% R.H, without steps 7a & 7b, un-powered Parts mounted on test board, without condensation on parts Measurement at 24±2 hours after test conclusion.	±(2.0% + 0.0005 Ω) No visible damage
Thermal Shock	MIL-STD-202 Method 107	-55/+125 °C Note: Number of cycles required is 300. Parts mounted on test board. Maximum transfer time is 20 seconds. Dwell time is 15 minutes.	±( 2.0% + 0.0005 Ω)
Short time overload	IEC 60115-1 4.13	5 times rated power for 5 seconds.	±( 2.0% + 0.0005 Ω) No visible damage
Board Flex/ Bending	IEC 60068-2-21	Device mounted on PCB test board as described, only 1 board bending required 2 mm bending Bending time: 60±1 seconds Ohmic value checked during bending	±(2.0 % + 0.0005 Ω)
Solderability - Wetting	J-STD-002B test B	Electrical Test not required Magnification 50X SMD conditions: 1st step: Method B, aging 4 hours at 155 °C dry heat 2nd step: leadfree solder bath at 245±3 °C Dipping time: 3±0.5 seconds	Well tinned (≥95% covered) No visible damage
- Leaching	J-STD-002B test D	Leadfree solder, 260 °C, 30 seconds immersion time	No visible damage
- Resistance to Soldering Heat	IEC 60068-2-58	Condition B, no pre-heat of samples Leadfree solder, 260±5 °C, 10±1seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	±( 2.0% + 0.0005 Ω) No visible damage



## REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	2019-01-14		- First issue of this specification

单击下面可查看定价，库存，交付和生命周期等信息

[>>Yageo\(国巨\)](#)